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CHRONIC
INTESTINAL STASIS.

A.—Types of Cases. B.—Preventive and Medical Treatment Outlined.

By

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New York City.

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CHRONIC INTESTINAL STASIS:*

A.—TYPES OF CASES. B.—PREVENTIVE AND MEDICAL TREATMENT OUTLINED.

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INTRODUCTORY REMARKS.

The history of medicine and surgery is a record of the long-continued struggle to discover *causes.* For many centuries, during the earliest period of recorded medical history, the *humoral* or, as it is sometimes called, the *bile* theory seemed to offer the only explanation for the various diseases to which the human organism is subject. During the earliest times, on through the periods made famous by Hippocrates, Celsus, Galen, and the different workers who left their impress upon the primitive records of medicine, the workers were groping in the dark. For more than a thousand years no one seemed able to lead out of the morass of "humors" and "bile."

Finally, however, in the fifteenth century, Paracelsus, nicknamed "Bombastus," because of his wonderful conceit, dared to express skepticism concerning the Galenic humoral hypothesis.

With the initiation of a modicum of doubt, there arose a rebellion which completely overthrew the theory of disease which had reigned supreme for so many centuries. One hundred years later it was difficult to find an advocate of the former theories.

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*The third paper of a symposium on chronic intestinal stasis, read before the Women's Medical Association of New York City, November 19, 1913.

From this time on the search for the cause of things progressed with relative rapidity.

With Harvey's discovery, in 1616, of the circulation of the blood, a leap was made toward the light. This discovery sealed forever the doom of the "four humors" theory, and sent the pioneers of modern medicine searching in entirely new directions.

A powerful aid in this crusade of investigation was furnished by the Dutch lens-grinder, Leeuwenhoek, when, in 1683, he sent his first contribution to the Royal Society of London, in which he gave conclusive evidence of the bacterial cause of disease. His revelation by means of his primitive lenses, of the "animalcules" in rain water, sea water, and subsequently of intestinal contents and other body fluids, opened a veritable new world.

With this crude beginning other scientists soon began to discover smaller bodies than those to which the Dutch lens-grinder had called attention, and the idea that these tiny "animals," as they were then thought to be, might be the cause of disease became so fixed in the minds of medical investigators that they soon became overenthusiastic; the pendulum swung suddenly too far in the direction of the modern world of bacteria. It was not long before the person suspected of having any disease was given an examination, and if the tiny bodies were found in the secretions or excretions the subject was promptly quarantined. Soon so many inhabitants of some of the progressive towns of the Continent were quarantined that not enough citizens were left outside to police the city or to conduct the daily business.

Naturally, the result of this too sudden and too revolutionary crusade was temporary "innocuous desuetude" on the part of the embryonic germ theory of disease.

Later on, however, Hooke's discovery of the cellular structure of plants had so entrenched the utility of the microscope in the minds of investigators that it was but natural for the pendulum to swing once more in the direction of the germ theory of disease. The discoveries of Virchow and his contemporaries with reference to the cellular structure of animal as well as plant life tended to place medicine and surgery on a firm scientific basis.

The perfection of the microscope rendered possible the epoch-making work of Lister, Pasteur, Koch, and the brilliant coterie of investigators who have immortalized the nineteenth century for its achievements in medicine and surgery.

It has been said that more was accomplished around the eighties of the last century than in all the preceding years. The germ theory of disease was now firmly established and no longer a matter for dispute. Attention now became fixed upon the differentiation of bacteria and the disease which they produced. This gave rise to much useful information, and eventually led the searchers after causes directly upon the idea that not the germs themselves so much as the poisons or toxins which they elaborate within the host are the causative factors in the production of disease.

Latterly, investigators have come to realize, even more than ever before, the importance of the cells themselves. With more recent investigations two factors have come to the foreground: first, internal secretions—the hormones, which regulate and bring into harmonious action the various functions of the tissues in the interests of physiological life; second, the *pars resistance* of the tissues themselves. Back of the internal secretions is the factor of the nutrition and life of the cells which compose the body. The power of the cells to do their work and the resistance of the tissues to the introduction of disease or disturbed function have thus come to play an important rôle in the study of pathological conditions, their prevention and their treatment.

The work of Carrel, by which he has shown that tissues may continue to live and grow almost indefinitely, *provided the toxins of the tissues themselves be removed,* marks another far-reaching evidence of great progress.

Just as it is with a part of the body, so it is with the body as a whole. This brings us to the subject of this symposium, *chronic intestinal stasis.*

CHRONIC INTESTINAL STASIS DEFINED.

Chronic intestinal stasis is not constipation. Some persons who are markedly static suffer from persistent diarrhea. Lane defines the condition as follows: "By chronic intestinal stasis I mean such an abnormal delay in the passage of the intestinal contents through a portion or portions of the gastro-intestinal tract as results in the absorption into the circulation of a greater quantity of poisonous or toxic material than can be treated effectually by the organs whose function it is to convert them into products as innocuous as possible to the tissues of the body."

The chief factor, according to Lane, in the production of this condition is the habitual assumption, by man, of the erect posture. Mechanical or evolutionary changes in the drainage system of the body result from the altered mechanical relationship of man to his surroundings. When in the erect position, there is a tendency of the abdominal viscera to downward displacement towards or into the true pelvis. If, as so often happens in the strenuous life of modern times, man does not allow himself the requisite compensatory rest in the prone position, the normal balance, so to speak, is lost, and nature endeavors to offset this state of affairs by the development of bands, which act as suspensory ligaments to prevent this general visceroptosis. Nature's efforts, however, may be thwarted by persistent and too-long assumption of the erect position, and these newly formed bands become "crystallized resistances," as Lane has called them, or "crystallizations of lines of force." When this takes place the viscera may still fall upwards into normal position when the subject is prone, but when the erect posture is assumed these bands of resistance, now become unyielding, hold the parts of the viscera to which they are attached up toward the point of fixation. As a consequence, the gastro-intestinal tract becomes kinked at certain sites of predilection for the development of these evolutionary bands. Varying degrees of obstruction of the lumen of the hollow viscus is the inevitable result. General slowing of the passage of the intestinal contents follows. To this state of affairs Lane first applied the term chronic intestinal stasis.

BRIEF HISTORY OF THE STUDY OF CHRONIC INTESTINAL STASIS.

A tendency has become manifest of late, to study the history of the great science of medicine, to become familiar with the evolution of the science as a whole, and to know more intimately the lives and achievements of those who have been most conspicuous in its development. It may not be without interest in this connection, therefore, to note in passing that Sir W. Arbuthnot Lane, of London, has led the way in

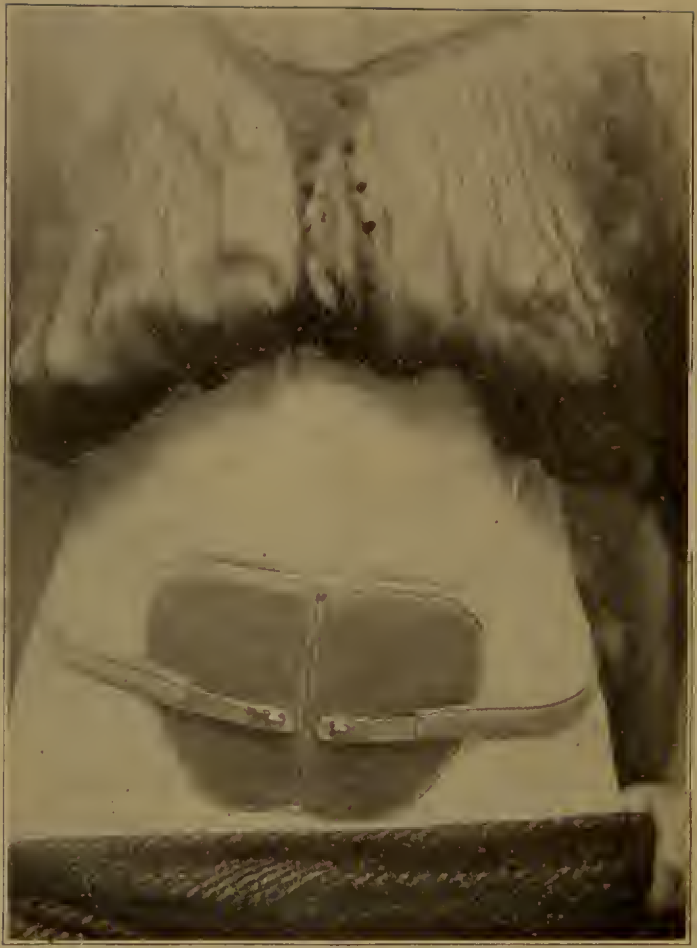

Fig. I.—Curtis Abdominal Belt in position (front view).

numerous directions. He is said, for example, to have been the first to resect a rib for empyema; the first to introduce saline solution into human blood vessels; the first to tie off the internal jugular vein for sinus thrombosis; the first to plate bones; the first to operate upon a cleft palate and harelip at the same time in a child under three years of age; the first to study chronic intestinal stasis as an entity, and to "short-circuit" or remove the colon for correction of this condition. When, in 1901, after years of observation, he published his first reference* to what he subsequently called chronic intestinal stasis and the various evolutionary bands which he believed to be causative factors in its production, little attention was paid to his theories His contentions with reference to the cause and the far-reaching effects of this condition were at first thought to be the expression of a fad on his part. Now, however, more and more consideration is being devoted to the subject in its various aspects. In some regards his work is unquestionably revolutionary. We may not now accept his sweeping contention that cancer, gout, diabetes, and almost all diseases are attributable to or are fostered by chronic intestinal stasis; nor may we agree with his view concerning the evolutionary origin of the "bands" and the "kinks" which give rise to the stasis. That these exist can be no longer doubted, nor is it longer doubted that divers conditions formerly attributed to other causes are in some degree associated with chronic intestinal stasis. Chronic intestinal stasis exists, often with bands and kinks, at times without either. The etiology may be as yet unsettled, but that there are many individuals suffering from this condition as described is certainly es-

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* The Clinical Journal, June 15, 1901, p. 100.

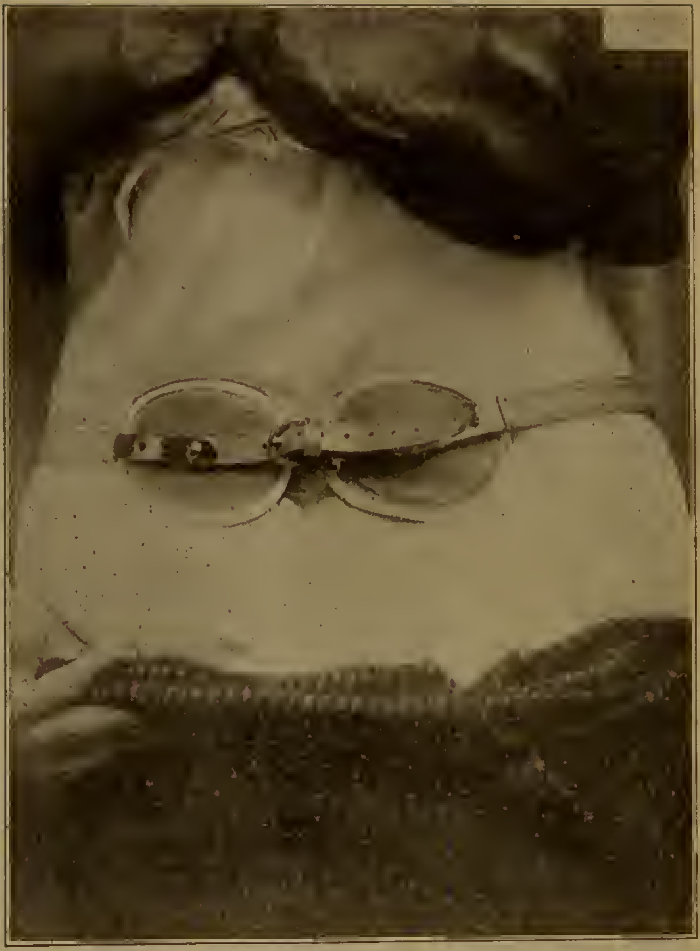

Fig. II.—Curtis Abdominal Belt in position (back view).

tablished. The main question, then, is how to relieve and cure them.

Just how far the investigation of this subject will lead us only time and experience will determine. From my study of Lane's work at Guy's Hospital during the last seven years, which includes personal observation for some weeks each time, of his cases before, during and after operation, and from my own experience, I am convinced that he has blazed a new trail and inaugurated a new era in medicine and surgery.

TYPES OF CASES.

Cases of chronic intestinal stasis may be classified as follows:

(1) *According to Etiology,* into:
  (a) Developmental or Congenital,
  (b) Inflammatory,
  (c) Combination of (a) and (b),
  (d) Mechanical or Evolutionary.

In another communication* I will discuss this phase of the subject.

(2) *According to Symptomatology.* This subject I have discussed elsewhere.**

(3) *According to Point of Occurrence of "Kink."***

(4) *According to Treatment,* into:

(a) *Beginning Cases,* in which, by preventive measures, a definite condition of stasis may be obviated.

(b) *Mild Cases,**** in which, by preventive measures and by moderate surgical procedures, such as cutting bands, replacing

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*"The Significance of Intra-abdominal 'Bands,' 'Folds' and 'Veils'," presented, by invitation, before the twenty-third annual meeting of the Western Surgical Association, St. Louis, December 19, 1913.

**"A Contribution to the Study of Chronic Intestinal Stasis," Medical Record, September 27, 1913.

***"Chronic Intestinal Stasis Surgically Considered," presented before the Medical Association of the Greater City of New York, New York Medical Journal, January 24, 1914.

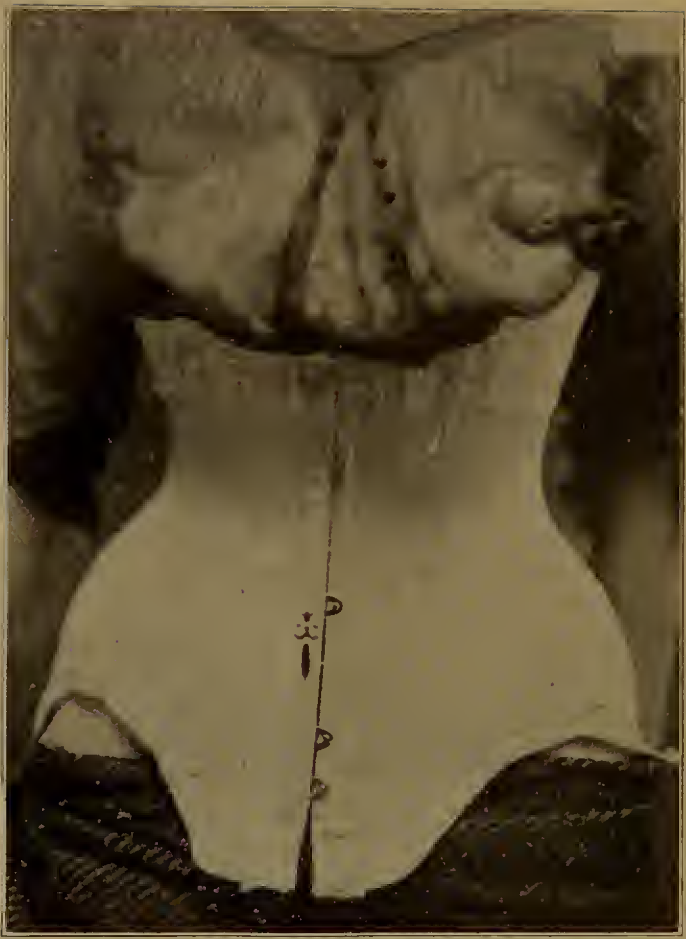

Fig. III.—Curtis Abdominal Belt in position, with corset over it (front view).

hollow organs, changing angles, the severer degrees of stasis are forestalled and the necessity of more radical surgical measures may be obviated.

(c) *Advanced Cases,*† in which, despite preventive treatment, or because of inefficient treatment, the condition progresses to the degree of stasis which requires the more radical surgical procedures (short-circuiting or colectomy).

BEGINNING AND EARLY CASES.

Having discussed, in other communications, the treatment of cases which require surgical intervention, I shall largely confine my remarks on this occasion to a consideration of the treatment of intestinal stasis by hygienic and medicinal measures, employed with the purpose of preventing the progress of the condition to the successive stages of severity.

For purposes of convenience we may consider this subject under the following heads:

(1) The care of the infant and child.
(2) The care of weak, delicate patients, and those recovering from severe illness.
(3) Dietetic regime.
(4) General hygienic measures, including exercises.
(5) Abdominal supports and properly fitted corsets.
(6) Medicinal measures.
(7) Minor surgical procedures.

The care of the infant and child. Proper care during infancy and early childhood undoubtedly tends to prevent the conditions which, in the adult, give rise to chronic intestinal stasis. Overloading the gastro-intestinal tract of the infant,

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†"The Surgical Treatment of Chronic Intestinal Stasis," the American Journal of Gastro-Enterology, July, 1913.

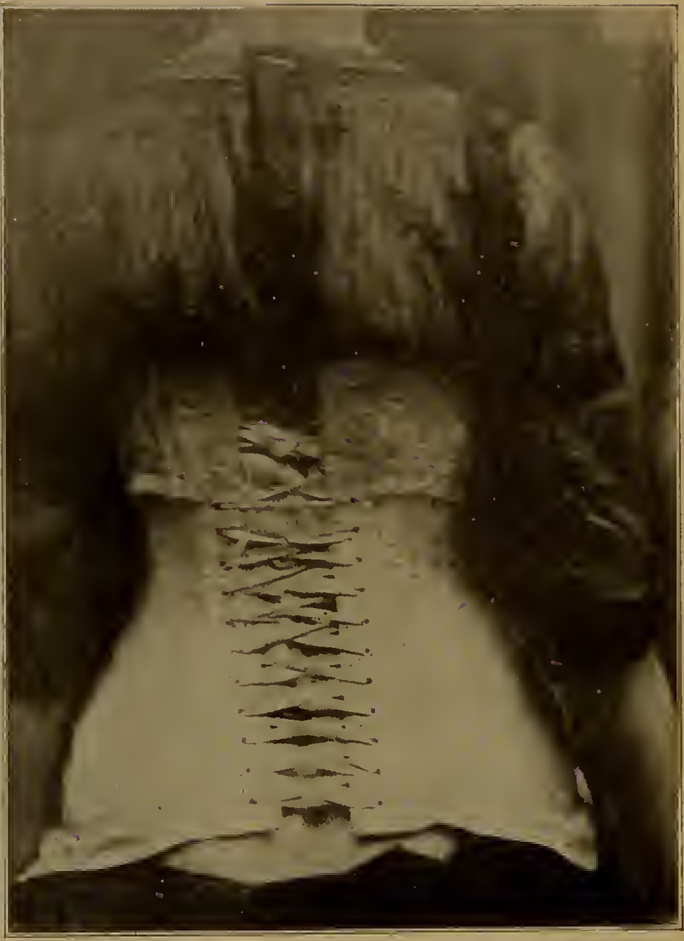

Fig. IV.—Curtis Abdominal Belt in position, with corset over it (back view).

particularly with so-called "prepared foods," may give rise to disturbances of digestion, to catarrhal inflammation, to distension of some portion of the tract, and to irritation and congestion of the peritoneum, eventuating in the formation of adhesions which fix portions of the bowel in abnormal position. If, added to this, the infant is made to sit up more than it should, if it is "dandled" and "bounced," as is so often done, visceroptosis may be initiated. The chances are that, as the child begins to walk, this state of affairs will grow progressively pronounced. Nature, in her effort to ward off trouble, begins to support the viscera by means of evolutionary bands along the lines of resistance, and these, in time, become crystallized into what we have come

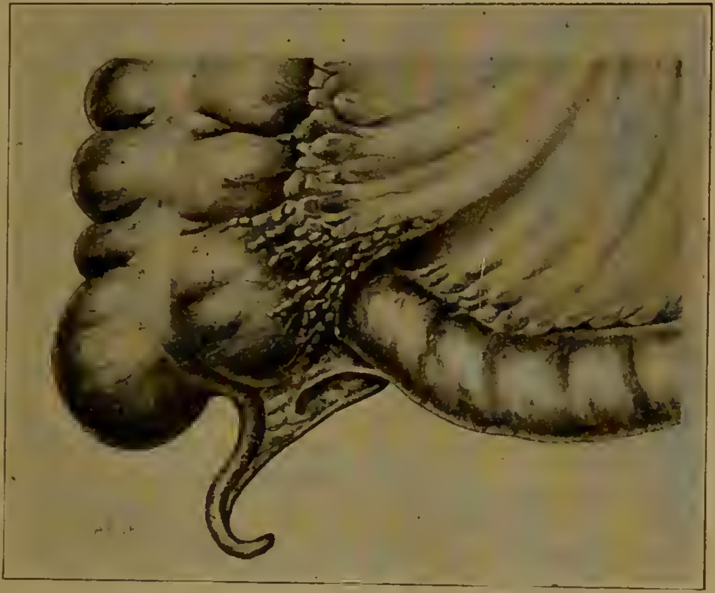

Fig. V.—A.Z. Shown for purposes of comparison. Laparotomy, New York Skin and Cancer Hospital, June 5, 1913, for condition other than stasis. Ileum, cæcum and appendix normal.

to know as Lane's evolutionary bands, which fix the bowel at certain sites of predilection. The slowing of the passage of the intestinal contents which was initiated in infancy thus becomes chronic intestinal stasis. Undoubtedly this condition occurs in a larger percentage of cases in children and young adults than is at present realized. It is important, therefore, that those who are entrusted with the well-being of infants and children should bear in mind the far-reaching evil effects of improper diet and habits. The infant should never be made to sit up or be held up immediately after taking food. If there is a tendency to chronic gastro-intestinal disturbances it is well when in bed to have the head on the level with the body, or, perhaps, a little lower. Children should not be allowed to sit or stand in cramped positions which prevent muscular relaxation, particularly immediately after meals.

The care of weak, delicate patients, and those recovering from illness. Patients who are congenitally weak and delicate, or who, through illness, have become viscerally atonic or asthenic, with a general loss of muscular tone and nervous energy, as well as those who are convalescing from serious illness, are prone to slight degrees of ptosis of the abdominal organs. In this class of cases there is a greater tendency than usual to a dropping over the brim of the pelvis of a loop of the ileum, causing a greater tug upon the intestine and increased resistance to its contents, or the duodeno-jejunal junction may be pulled upon and angulated. In such cases milder degrees of ptosis occur, which may be easily corrected by abdominal supports, by tonic regime, by building up the nutrition, and by rest, until the tonus of muscles and nerves has returned.

Dietetic regime. There are no hard-and-fast rules to be followed in the regulation of the diet of persons who manifest a tendency toward chronic intestinal stasis, or for those who are definitely static. In these, as in all other instances, the individual requirements must be taken into consideration. On general principles, however, it may be safely stated that articles of diet usually classed as "indigestible" should be eliminated, since these tend to accumulate in undigested masses in the cecum and other portions of the large bowel, causing a drag in the overloaded and distended portions, with a ptosis of these parts first, and a subsequent pull upon other portions of the tract. A diet too rich in animal proteids is particularly unsuited to the needs of static patients. Unless this material is promptly eliminated, abnormal fermentative and putrefactive changes take place, the intestines are further unduly distended, and the tendency to stasis is aggravated. In some instances, undoubtedly, over-indulgence in a meat diet initiates the vicious circle which culminates in chronic intestinal stasis, and which may eventually lead the patient to the operating table.

The matter of diet, then, resolves itself here, as elsewhere, into a question of elimination. The individual case should be studied, therefore, and the diet regulated accordingly. This applies to infants as well as to adults, and to stasis patients before as well as after operative treatment.

General hygienic measures, including exercise. Under this head may be mentioned the various matters which come under the category of "regular habits of life." Proper attention to flushing the tissues by the drinking of plenty of water, and by the skin-elimination of effete material by rational bathing, are matters not to be overlooked in the hygienic prevention and treatment of chronic intestinal stasis. Exercise in the open air is likewise of importance, and is not compensated for by any amount of indoor exercise, however rational this may be. Women are particularly prone to neglect this important factor in health-maintenance, which undoubtedly accounts, in part, at least, for a large proportion of cases of chronic intestinal stasis among members of this sex.

Great benefit may be derived, however, from physical exercises designed particularly to meet

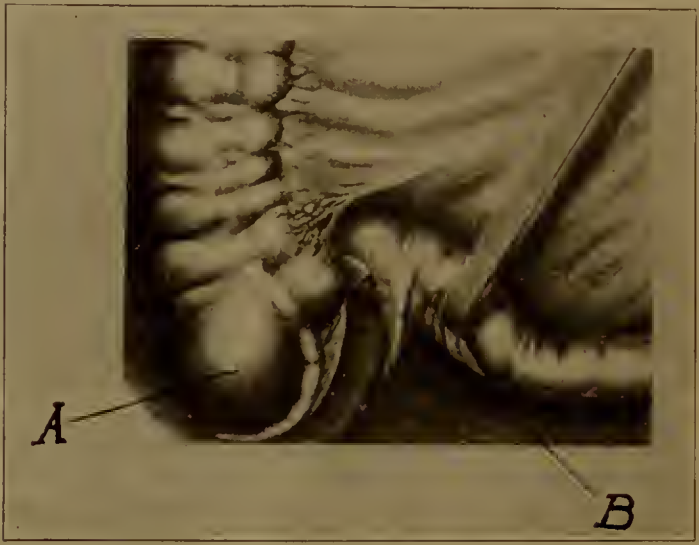

Fig. VI.—M.W., female, 29, single. Referred by Dr. E. M. Mosher. Operation, New York Polyclinic Hospital, June 3, 1913. (A) Mobile caput colii; (B) Lane's band.

the needs of these patients. Exercises which tend to strengthen the abdominal muscles are especially advantageous. Abdominal massage is beneficial, both as a preventive and as a curative measure. Electricity may be utilized to advantage for this purpose. Flushing the bowel has been recommended by some as an important hygienic measure in the management of these cases. This may help temporarily in some instances, but it has its elements of real danger and should be wisely advised and carefully employed. Regular and systematic habits with reference to evacuation of the bowels is of the greatest importance.

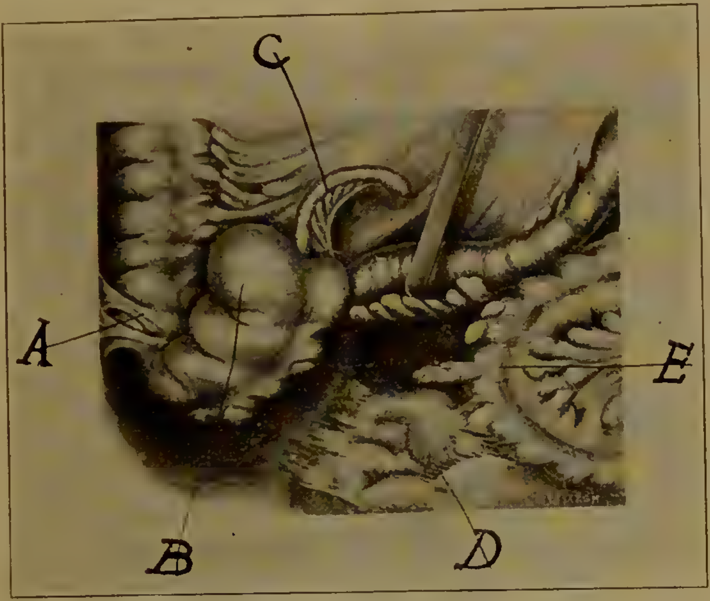

Fig. VII.—A.L., female, 42, widow. Operation, New York Polyclinic Hospital, May 23, 1913. (A) Strong bands to ascending colon. (B) Mobile cecum. (C) Appendix placed upwards on anterior surface of mesentery, and adherent. (D) Right tube and ovary seat of inflammation. (E) Long redundant sigmoid adherent to right adnexa.

Abdominal supports and properly fitted corsets. Ill-fitting corsets undoubtedly play a part in the causation of enteroptosis, and, consequently, in the production of chronic intestinal stasis. The pressure by corsets, belts, or other abdominal supports, should be made over the lower part of the abdomen, upwards and backwards, and not, as is often the case, on the upper part of the abdomen and base of the thorax, downwards. A properly fitted abdominal belt, such as that devised by Dr. Eliza M. Mosher, or the Curtis belt, recommended by Lane, forms an important part of the care of the stasis patient before and after operation. Dr. Mosher illustrates her belt, and I append pictures of the Curtis belt (Figs. 1, 2, 3, and 4). Numerous other good belts are on the market. The belt, of whatever make, should do the work it is intended to accomplish. It should be properly fitted, according to the principles involved, and then it should be properly put on. In adjusting the belt the patient is so placed that the abdominal organs are in as nearly normal position as is possible. In other words, the patient should lie down, with the buttocks elevated, and the abdomen should be massaged from below upwards, and the belt then applied. In some cases, where the intestines are adherent over the brim of the pelvis, a belt cannot be worn. If there is any doubt concerning the utility of the belt in a given case, X-ray plates may be taken to determine the point.

Medicinal treatment. Aside from tonic and other supportive measures, little medication is necessary in the treatment of early intestinal stasis. The necessity of cholagogues should be eliminated by the institution of good hygienic and dietetic habits. Aperients and cathartics, which formerly played so extensive a part in the treatment of disordered alimentary elimination, have been largely supplanted by the use of lubricants. In some cases, however, it may be necessary to have recourse to laxatives. In such cases, cascara sagrada three times a day, gradually decreasing the dose, is possibly as satisfactory as any other agent. Agar-agar, in fluid form or in biscuits, has been recommended* in cases in which there is dehydration of the intestinal contents.**

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*Schmidt—Munch. Med. Woch., 1905, No. 41.

Liquid paraffin, or Russian mineral oil, is the agent which, by common consent, is pronounced the most satisfactory in the treatment of these cases.

The crude oil, as it is obtained from the Russian or other oil wells, is a mixture of various hydrocarbons of the paraffin series, some

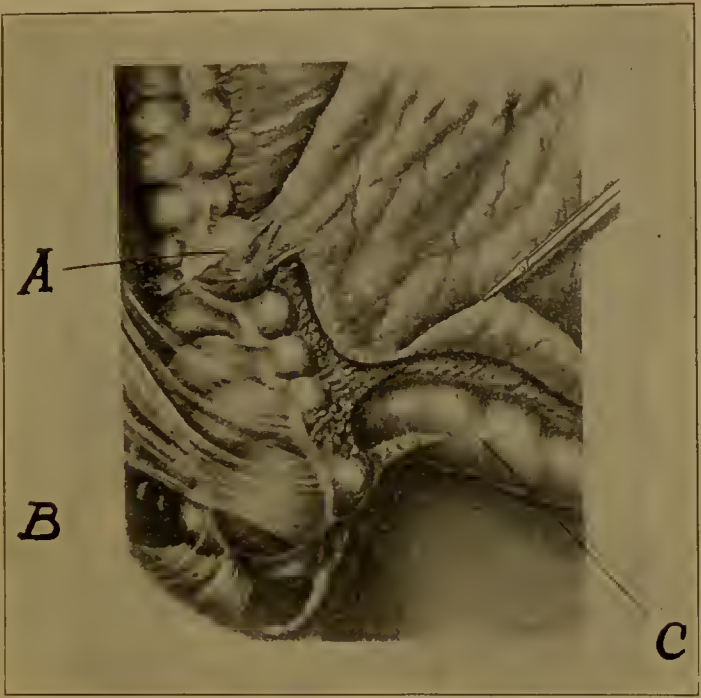

Fig. VIII.—A.S., female, single. Referred by Dr. Herman Eichorn. Operation, New York Polyclinic Hospital, June 7, 1913. Cancer and Stasis. (A) Carcinomatous mass found in ascending colon, near ileo-cecal valve. Great omentum adherent to mass, thus fastening greater curvature of stomach to ascending colon. (B) Jackson's membrane. (C) Marked ileal stasis.

**Leslie R. Murray—The American Practitioner, Aug., 1913.

of which are irritating and harmful. The liquid paraffin commonly found in the market is not sufficiently refined to be entirely free from irritating ingredients, or to be agreeable to the taste. Some of the products are too thin, and consequently give rise to ''dribbling,'' which is not only extremely disagreeable, but defeats the purpose for which the oil is given.

The best liquid paraffin is that of the British Pharmacopoeia, the description of which follows:

''A clear oily liquid, obtained from petroleum, after the more volatile portions have been removed by distillation.

''Character and Tests.—Colorless, odorless, tasteless, not fluorescent. Boiling point not below 680 degrees F. (360 degrees C.). Specific gravity from 0.885 to 0.890. 3 cubic centimetres, heated with an equal volume of sulphuric acid in a test-tube placed in boiling water for 10 minutes, with frequent agitation, should not color the separated layer of acid of a deeper tint than pale brown. Alcohol (90 per cent.) boiled with Liquid Paraffin should not redden blue litmus paper (absence of acid). A mixture of 4 cubic centimetres with 2 of absolute alcohol, and 2 drops of a clear saturated solution of Lead Oxide in solution of sodium hydroxide, should remain colorless when kept at 158 degrees F. (70 degrees C.) for 10 minutes (absence of sulphur compounds).''

Whatever the preparation of liquid paraffin employed, it should come up to the standard of the above product. For a number of years I have imported this from the General Apothecaries Company, of London, being unable to obtain a satisfactory oil in this country. Subsequently Haas Pharmacy, of New York, began to dispense a good Russian mineral oil, and latterly other products which meet the requirements of the British Pharmacopoeia have been put forth. "Atolax," a British product, which meets the above requirements, is one-half of one per cent. casein, a little flavoring matter, and the best liquid paraffin. It is of the consistency of light blancmange or jelly. It is given in the same dosage as the oil. It is used in London, and is being tested here. "Interol" is a preparation which is being placed on the market by Van Horn and Sawtell, of New York. "Sternol" and "Astol" are other products which come up to the standards of the British Pharmacopoeia. Many of the oils on the market should be used, if at all, for ordinary automobiles rather than

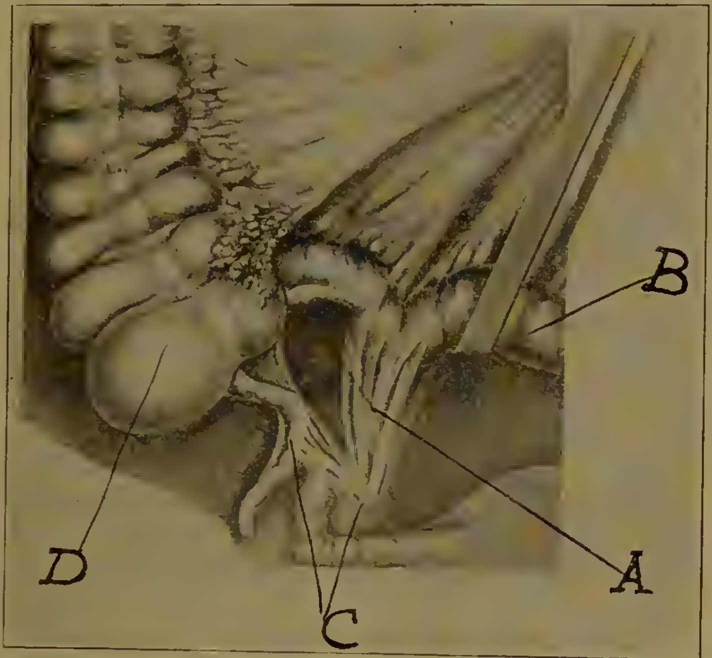

Fig. IX.—E.B., female, 30, single. Referred by Dr. E. M. Mosher. Operation, Alston's Private Hospital, February 11, 1913. (A) Lane's band. (B) Ileal stasis. (C) Appendix and ovary caught in band. (D) Cæcum dilated.

for the human machine. For this reason it seems but just to the method of treatment and to the patient that a word should be said regarding the few preparations of Russian mineral oil which, from personal observation, have proved satisfactory.

Dosage and method of administration of Liquid Paraffin. It should always be given on an empty stomach, morning and evening, or one-half hour before meals. It may be taken directly from the bottle, a good swallow, or about a tablespoonful at the time, the patient sitting up while taking it. If the patient objects to the oily feel in the mouth, a little syrup of lemon may be added. This is put in the bottom of the glass, add the oil, and swallow. The preparations of the oil which are flavored sometimes prove obnoxious to the patient after a time. For children it is a good plan to put a little honey in the bottle first, shake it up, add the oil and let them take it from the bottle.

Action of Liquid Paraffin. The chief action of the oil is mechanical. It acts as a lubricant to the intestinal tract and as a coating to the outer surface of the fecal masses. It thus facilitates the passage of the contents of the canal. It also exerts a protective action, preventing irritation and abrasion of the mucous membrane. It is not absorbed, the full quantity given passing with the contents of the intestine. Inasmuch as it is not digested it does not clog the liver, the great toxin protector of the body. Professor Maurice Packard, of the Department of Medicine, New York Polyclinic, Medical School and Hospital, in a personal communication, informs me that he has found, in eight cases in which he has employed paraffin oil, indican has been eliminated in a few days.

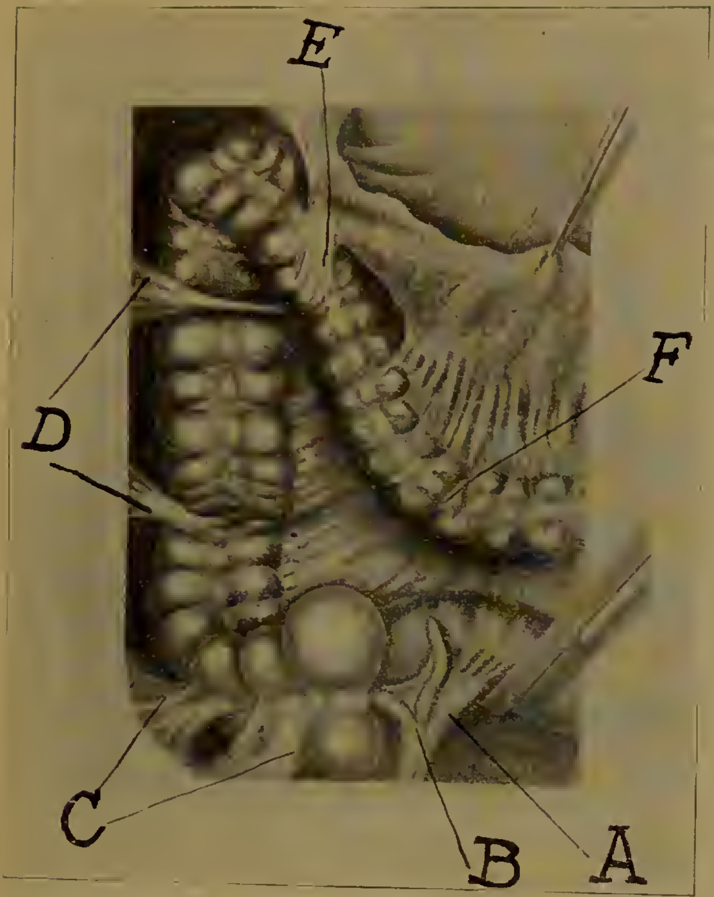

Fig. X.—C.S., female, 20, single. Referred by Dr. Wm. T. Scovil. Operation, New York Polyclinic Hospital, July 1, 1913. (A) Ileal band. (B) Appendix caught in band and adherent to ileum. (C) Bands to cæcum. (D) Bands to ascending colon. (E) Band from gall-bladder across duodenum and over transverse colon causing much obstruction. (F) Enteroptotic transverse colon.

The oil is not decomposed within the intestinal tract, and does not become "rancid." It has no constipating after-effect. It is not an active cathartic like castor oil.

It has been asserted by some, and denied by others, that liquid paraffin exerts a bactericidal action within the intestinal tract. In order to throw some light upon this subject a series of experiments were conducted under my direction by Dr. Elizabeth Finch, Research Fellow, in the Research Department of the New York Skin and Cancer Hospital. Full report of this work will be published in the near future.

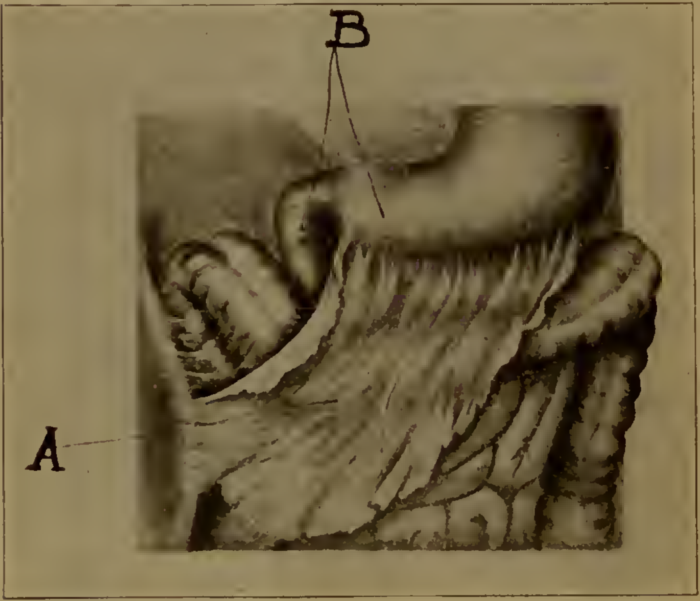

Fig. XI.—E. N., female, 46, married. Operation, New York Polyclinic Hospital, March 22, 1913. (A) Omentum adherent to abdominal wall. (B) Dilated duodenum and ulcer of stomach.

The bacteria studied for their growth on artificial media in the presence of mineral oils were as follows: B. aerogenes capsulatus (Welch)*, considered by Herter "the chief cause of intestinal putrefaction;" B. putrificus (Bienstock)*; B. proteus vulgaris*; B. botulinus*; B. enteritidis (Gaertner type)*; B. paratyphosus (B)*; B. lactus aerogenes*; B. coli communis; B. coli communis (2 strains); B. dysenteriæ (Flexner)*; B. paratyphosus (A); B. typhosus; B. mycoides*; Aurococcus (2 strains); Albococcus (2 strains); and the Streptococcus pyogenes. The bacteria marked with an asterisk were obtained in pure culture from the Bacteriological Distributing Bureau at the American Museum of Natural History.

Of this group the strictly anaerobic bacteria were the B. Welchi, B. putrificus, and B. botulinus.

The four mineral oils were petroleum derivatives, one an imported oil, Russian Mineral Oil; the others of local manufacture (three different sources) were obtained under the trade names of Rusol, Mineral Oil, and Albolene.

The above mineral oils were used in connection with these bacteria in vitro on the assumption that the oils undergo no chemical change within the intestinal tract. All samples of the imported oil showed no growth (under aerobic or anaerobic conditions) of bacteria or of fungi within 72 hours on sterile gelatin agar or glucose agar plates; nor was there any growth obtained when from 2 to 5 c.c. was thoroughly shaken with neutral glycerin or glucose bouillon and incubated for this length of time at 22 degrees C. or at 37 degrees C. This "oil" was considered sterile in so far as these experiments were concerned. Some samples of the American Mineral Oil were sterile, in the sense that the above oil was sterile, others gave from 2 to 4 contaminating colonies present in one c.c. of the oil. No sample of the Albolene was sterile and the Rusol gave an average of 2½ colonies to a c.c. of the oil developing within 48 hours. The Rusol and Albolene were slightly cloudy, the Rusol out of proportion to the number of bacteria suspended in its medium. The oils that were unsterile when received were not sterilized previous to use except as recorded. The condition in which they were received represented their condition as distributed for therapeutic use.

It would appear, from these experiments, that bacteria (*a*) strictly aerobic would be inhibited in their growth for the time, or, bacteria (*b*) faculative anaerobic upon cultivation, would, before adaptation to their environment has taken place, be retarded in their growth in the presence of the Russian mineral oil and media, when the soil in which they were present though suited to their growth in other respects contained no easily available oxygen (applicable to all the above organisms with exception of the obligate anaerobes). The degree of retardation would appear to depend upon the presence or absence of available oxygen suspended in the oil, and the viscosity of the oil—mechanical and physical factors.

In vitro, for the cultivation of obligate anaerobes, the Russian mineral oil acts as an aid in producing anaerobic conditions for growth when air bubbles are excluded from its medium and from between the oil and the media inoculated. These bacteria develop within culture media under oil as luxuriantly as when oxygen has been removed from the air (Hiss and Buchner methods) in contact with the surface of the media. In this respect the Russian mineral oil, of greater viscosity and specific gravity than the other oils experimented with, acts slightly better than the American mineral oil, and decidedly better than that lighter oil of this series of hydrocarbon derivatives of petroleum, Albolene.

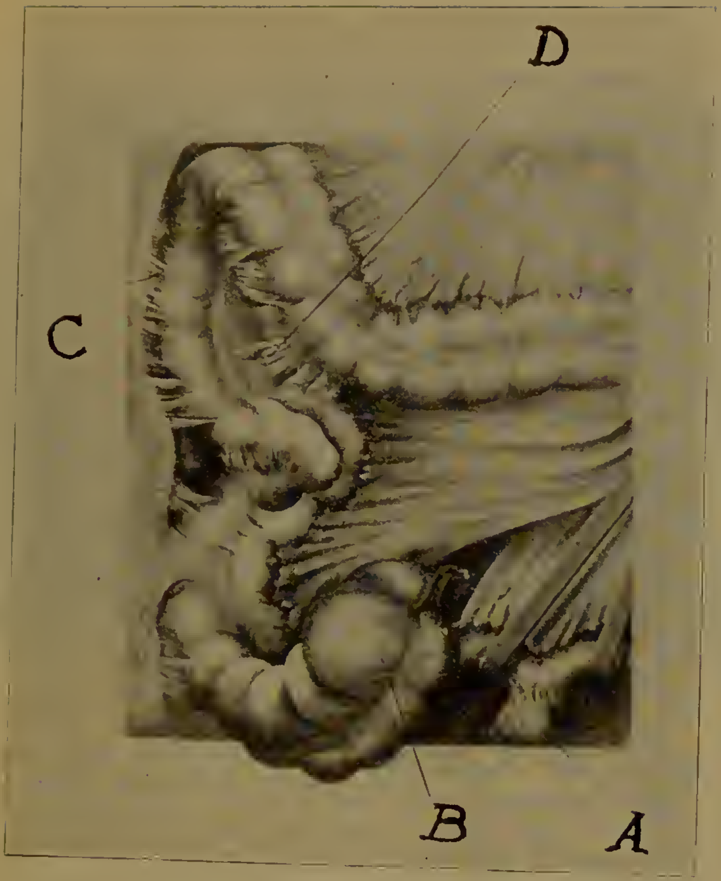

Fig. XII.—E.N., female, 46, married. Operation, New York Polyclinic Hospital, March 22, 1913. (A) Lane's band. (B) Mobile cæcum. (C) "Jackson's membrane." (D) Intercolonic adhesions.

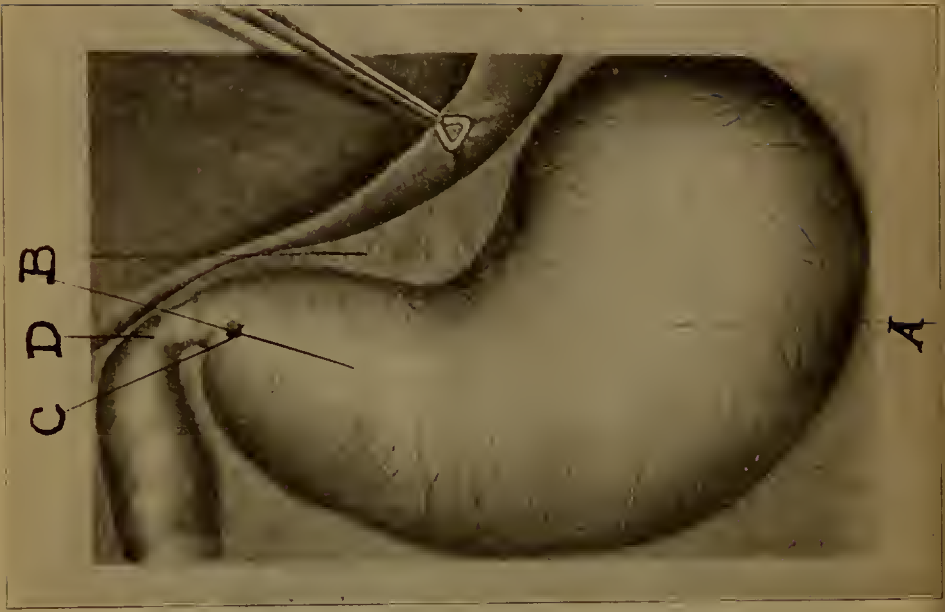

Fig. XIII.—C.B., female, 45, widow. Operation, Skin and Cancer Hospital, June 2, 1913. (A) Dilated stomach. (B) Veils around congested pylorus. (C) An ulcer size of dried pea found, with a varix of one of the veins. (D) Duodenum angulated at duodeno-jejunal junction—duodenum in consequence dilated—dilated duodenum seen in picture.

However, the Russian oil, owing to its greater viscosity, less readily yields up by mechanical means, gas bubbles, oxygen or other gas which may be present in its medium.

What application this action of the Russian mineral oil might have in connection with the group of these same obligate anaerobes or facultative anaerobes within the alimentary tract, assuming (because not otherwise proven) the oil to undergo no chemical change, would depend upon the amounts given whether sufficient to produce catharsis and by its viscosity mechanically remove bacteria; upon the location of the stasis whether under anaerobic or partially anaerobic conditions; and, possibly, upon whether the oil held any oxygen in suspension. Supposedly, any oil in which bacteria find no soil for growth and which in itself undergoes no chemical change, as is the case with these oils, might, if of sufficient viscosity, mechanically separate in part or in entirety non-motile or sluggishly motile bacteria from the means of their most active growth, and thus diminish the products of their activity.

Moderate Surgical Procedures. Whether from neglect, from inefficient treatment, or despite careful management, many cases progress to the stage of chronic intestinal stasis in which the measures outlined above are not sufficient. It then becomes necessary to perform laparotomy for the purpose of cutting bands, straightening kinks and angulations, perhaps removing the appendix when it is the site of involvement. In such cases, before and after operation, the other lines of treatment above outlined are indicated.

In other communications* I have presented series of pictures of actual cases in which I have been able to verify upon operation the conditions which Lane has so often and so clearly discussed. Later I shall deal with the advanced group from personal experience and from observation of Guy's Hospital cases operated upon by Lane and examined by me.

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* (1) "Remarks on Chronic Intestinal Stasis, with Reference to Conditions Found at Operations and the Mortality."—B. M. J., Nov. 1, 1913, p. 1129. (2) Op. cit. "The Significance of Intra-Abdominal 'Bands,' 'Folds' and 'Veils.'"

The pictures presented herewith are selected for the same purpose rather than as illustrations of specific types of cases.

My own experience, like that of many others, furnishes corroborative evidence of the correctness of Lane's views concerning the existence of the various "bands," "veils" and "folds," and other adventitious structures within the abdomen, the kinking of the gastro-intestinal canal by these, and the production thereby of the condition to which he first applied the term, chronic intestinal stasis. William J. Mayo, at

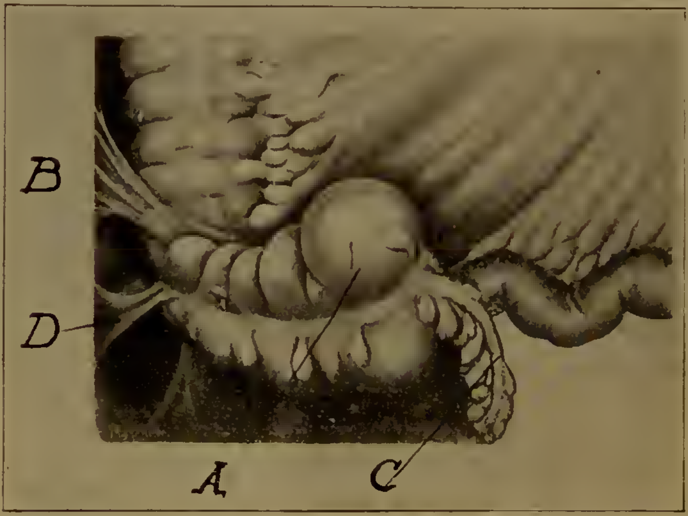

Fig. XIV.—O.B. (A) Mobile cecum. (B) A Jonnesco's fold. (C) Appendix not diseased. (D) Jackson's membrane.

his clinic in Rochester, recently made the statement, in the hearing of the writer, that a short time ago he was able to say that he was convinced as to the correctness of five per cent. of the claims of Lane with regard to stasis; now he has reached to thirty per cent., and is progressing. Herbert Paterson, of London, says he has reached forty per cent. and is going on. If even this percentage of Lane's claims be established for stasis, a new era has come and a veritable renaissance has again dawned for medicine and surgery. Moynihan,* in a recent article, referring to Lane's work, says: "The claims that Lane makes in respect of such patients must indubitably be admitted. I have never in these cases nor indeed in any of 'alimentary toxæmia,' found it necessary to consider the question of a removal of the entire colon. As to the further claims which are made, I have not yet arrived at the point where I can admit them, but the hypothesis charms by its simplicity, and attracts by its magnitude, and I am traveling hopefully." With men like Paterson, of London, Rutherford Morrison, of New Castle-on-Tyne, Harold Stiles, of Edinburg, Chapple, of London, Percy, of Chicago, Coffey, of Portland, and a host of others, exploring the field which Lane, the pioneer, has opened up to us, we may say, with Moynihan, that we are "traveling hopefully."